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This is a much abbreviated list of some of the headings under which regular features or occasional contributions are published in the monthly issues of SOAP, PERFUMERY & COSMETICS

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HUMECTANTS VERSUS MOISTURISERS

OTTO K. JACOBI, Ph.D.*

IN the cosmetic industry quite a confusion exists concerning the terms "humectant" and "moisturiser". The Random House Dictionary of the English Language, College Edition 1968, includes the following definitions:

"*humectant*" 1. a substance that absorbs or helps another substance retain moisture, as glycerol.

"*moisturise*" 1, to impart or restore moisture to (something), v.i.

2, to supply moisture.

These definitions clearly show that a humectant plays a passive role with respect to moisture, namely it helps a substance to absorb or retain moisture, while a moisturiser has an active effect with respect to moisture, it imparts or restores moisture or supplies moisture to something.

In the technology of cosmetic materials the terms "humectant" and "moisturiser" should be used in the same sense. A humectant is a material like glycerin, propylene glycol, other glycols, sorbitol, sodium pyrollidone carboxylic acid and sodium lactate, which do help cosmetic emulsions or other cosmetic preparations to retain their water or moisture content.

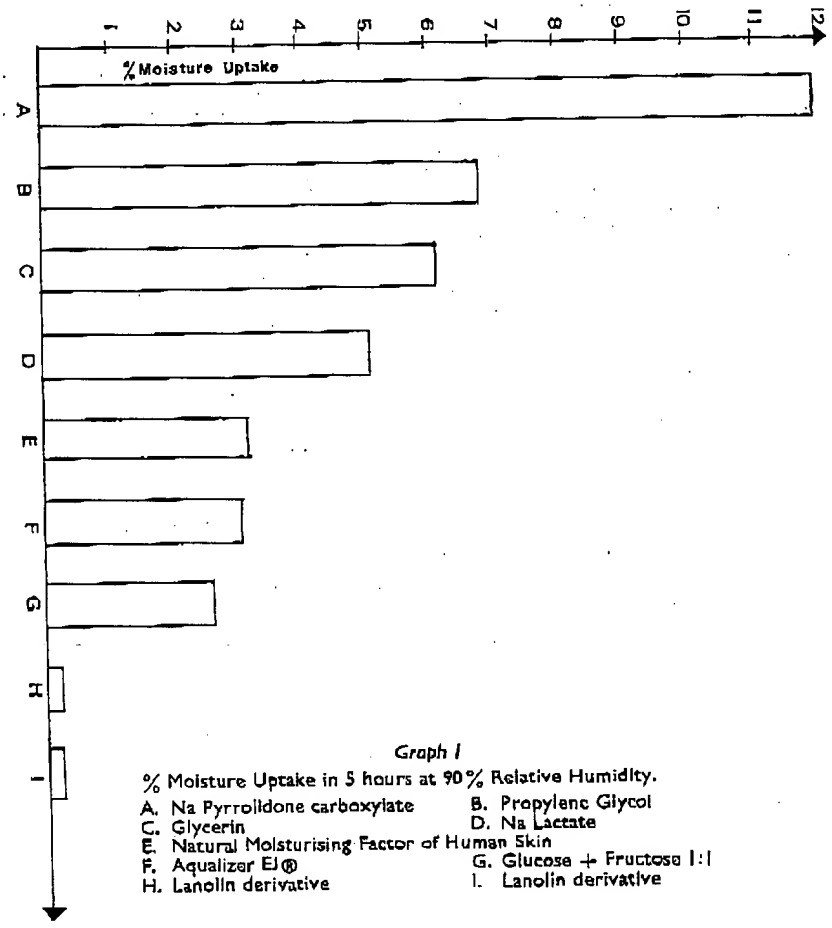
Unfortunately they very often are incorrectly called moisturisers and used like moisturisers in so-called moisturising creams and lotions.

A moisturiser in a cosmetic product is supposed to impart or restore moisture to the stratum corneum of the skin. That humectants are not able to do an active moisturising of the stratum corneum has been proven by several investigators,[1,2,3,4]. For the sodium salt of pyrrolidonecarboxylic acid the humectant qualities have been shown by Laden[5].

Moisturisers like the synthetic NMF (trade name: Aqualizer EJ)® and certain lanolin derivatives have either a very balanced, relatively weak hygroscopicity or no hygroscopicity at all, but they impart, restore or maintain moisture in the stratum corneum of the skin. The humectants on the other hand have a very strong hygroscopicity, as Graph 1 shows.

Looking at the chemical composition of two of the lanolin derivatives, one being "oil soluble liquid esters of a purified lanolin fraction", and the other, being "isopropyl esters of highly purified lanolin fatty acids", it is quite clear, as Graph 1 also demonstrates, that these products have no hygroscopicity and consequently cannot be looked upon as humectants. Their effect is to build a more or less occlusive film on the skin surface which prevents moisture loss of the stratum corneum. They may also impart some moisture, present in the film, to the horny layer of the skin, but this seems to me questionable. Aqualizer EJ®, a synthesis of the natural moisturising factor of the human skin, is based on the factor's chemical analysis.

NMF is a registered trade mark ® of Kolmar Laboratories Inc., pertaining to moisturising materials. Aqualizer EJ ® has by its nature the very balanced hygroscopicity of the natural



Graph 1

% Moisture Uptake in 5 hours at 90% Relative Humidity.

A. Na Pyrrolidone carboxylate
B. Propylene Glycol
C. Glycerin
D. Na Lactate
E. Natural Moisturising Factor of Human Skin
F. Aqualizer EJ®
G. Glucose + Fructose 1:1
H. Lanolin derivative
I. Lanolin derivative

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moisturising complex of the human living skin. The term NMF (Natural Moisturising Factor) is today very widely used to refer to the skin's natural moisturising factor. This term was created by Jacobi in 1959 when he delivered a speech at the scientific section of the American Toilet Goods Association[5] (see also [7,19,24]). The same author was not only the originator of the term NMF, but he was also the discoverer of the moisturising factor of the living human skin[8,9,10, 22,23].

There have been several attempts to use single hygroscopic components of the natural moisturising factor of the skin as substitutes for it. Fox and co-workers,[3], have recommended sodium lactate, others called the free amino acids in the water-soluble extract of the stratum corneum the active part of NMF,[16,20]. Spier and Sparta,[10], found urea to contribute significantly to the hygroscopic qualities of NMF. Jacobi has shown that the amino-acid-sugar condensation products present in NMF have hygroscopic properties,[11,16]. Recently Laden and Spitzer,[13], set out to investigate the chemical nature of natural moisturising agents present in skin and showed that sodium pyrrolidone carboxylate is a naturally occurring humectant. G. Pascher[14], had already shown in 1956 that pyrrolidone carboxylic acid and its salts are present in NMF. This author also states that PCA is a metabolism end-product of the animal organism and occurs in abundant amounts in urine if glutamic acid has been fed. It is therefore not specific for the skin. Padberg considers glucose and fructose the most important moisturising components of NMF,[20,12].

All attempts to use single constituents of the skin's natural moisturising factor instead of the complete complex have so far failed. Compounds like sodium lactate, sodium pyrrolidone carboxylate and glycerin are too strongly hygroscopic and tend to dry the skin out rather than moisturise it, while amino acids, sugars and urea are too weak as moisturisers. Amino-acid-sugar-condensation products are constituents of the NMF of the living skin,[11,12,16, 17,18,21], but by themselves they have again too high a hygroscopicity and therefore have to be blended with other constituents of NMF in the ideal proportions to result in a complex with properties, resembling closest those of the skin's natural moisturising factor. A complex of this type is represented by Aqualizer EJ® which, does not contain any materials not present in the naturally occurring moisturising agent.

In the human physiology, very often complexes of biochemical materials are the basis to achieve certain physiological functions. This is a principle of nature and is certainly also used in the moisturising factor of the skin.

Summarising, one can say that humectants are technical components of cosmetic products to prevent the water-loss or moisture-loss of the cosmetic preparations, while moisturisers are specific active additives for the skin to impart or restore moisture to the stratum corneum.

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THE FIFTH INTERNATIONAL CONGRESS ON ESSENTIAL OILS

From our Resident Correspondent

DENIS I. DUVEEN, F.R.I.C.

THE fifth International Congress of Essential Oils was held in São Paulo from October 11 to 16, 1971, under the patronage of the Brazilian Government. The international character of the meeting may be gathered from the fact that it was attended by no less than 200 overseas delegates from a total of 25 countries. The U.S. contingent was the largest with 45 members; the next in numbers was that from France which consisted of 36 people. The Argentine sent 28; Japan 17; Italy 15; West Germany and Spain 7; Paraguay 6; Portugal, Canada and Great Britain 5; Chile, Mexico and Russia 4; South Africa, Bulgaria, Egypt and Holland 3; Algiers and Belgium 2; Jamaica, Poland, Switzerland, the Philippines and Formosa 1.

The working sessions were held in the two halls of the Catholic University and included three one-hour-long papers:

"Unrecorded Essential Oils of South America," by Dr. Robert Favre.

"Chemio-Systematics; a method for Hunting Essential Oils," by Dr. Otto Gottlieb.

"Identification of Peaks obtained in Vapour Phase Chromatography," by Dr. Remolo Ciola.